BE4/J. Grimwood

JSC-08053

SKYLAB 1/2 TECHNICAL CREW DEBRIEFING

JUNE 30, 1973

PREPARED BY

TRAINING OFFICE

CREW TRAINING AND SIMULATION DIVISION

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National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

Houston, Texas

KERWIN (CONT'D) Unusual or Unexpected Visual Phenomenon. We saw light flashes. I think all of us saw them. I saw them most often when I was in the sack at night with my eyes closed but awake naturally. They tended to wax and wane in frequency. Someone asked me if that was in conjunction with the South Atlantic anomaly. It may have been. I didn't have the pad with me at that time and I don't know. They were numerous at times - two or three per minute.

CONRAD Some of them to me were a spot or sunbursts. Some were streaks. The streaks, in my case, were less frequent than the bursts. Most of them were in my peripheral visual field. Very few in the central visual field. I don't know why.

QUERY You could isolate them to one eye, couldn't you?

KERWIN No, I couldn't.

WEITZ I would say mine were primarily in the left eye for some reason.

CONRAD You have to concentrate but you can determine they are in one eye.

KERWIN I did not. That was foolish of me but I didn't try. I'm sure they are in one eye.

CONRAD Sometimes I'd be lying there with my eyes half closed, and I'd see a fire sensor wink.

KERWIN And you'd have to be careful that you weren't confusing that with the fire flash. Once you've seen a few of each, there is question of which is which. They're not an hallucination.

KERWIN We didn't feel it was operationally necessary for anybody to know about it right now.

WEITZ I had a couple that I thought were cosmic particles. I saw an entrance streak and an exit streak.

CONRAD Yes, I did too.

WEITZ Where, bing-bing, it seemed like it was one side of the eyeball, and then the other side.

CONRAD One night I remember that there was a long shot then it was blank then there was a long shot in rapid succession, of course, but very definitely in and out - or across the eye.

KERWIN Medical Kits and IMSS. As far as adequate quantity of medication and supplies, I would guess we used about 0.01 percent of the available medication. I think this is something for me to sit down with the doctors and talk about. There is plenty of medicine up there for the Skylab missons. There is

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SKYLAB 1/3 TECHNICAL CREW DEBRIEFING

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National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

Houston, Texas

OCTOBER 4, 1973

BEAN I did too. The sack would move over in the corner.

LOUSMA Things we saw out the window.

GARRIOTT For example, we saw that satellite about a week before splashdown. That was one of the most unusual things that we saw and I guess Jack noticed it looking out the window. This bright reddish object was out there and we tracked it for about 5 or 10 minutes. It was obviously a satellite in a very similar orbit to our own. It was rotating and had a period of almost exactly 10 seconds because you could see the brightness vary with that period. We followed it until sunset and it went out of sunlight just about 5 to 7 seconds after we did. It held its position nearly the same, in the wardroom window for that 10-minute interval although we could see it drift in relative positions slightly, maybe 10 to - 20 degrees during the course of that 10-minute interval. It was reddish in color even when we were well above the horizon. As we approached sunset, it turned more reddish, presumably because of the sunlight change. What satellite it was and how it happened to end up in such a similar orbit, no one ever explained to us. And I would like to hear a few words from someone about that satellite.

BEAN You bet. We never saw it again. You'd think we would have seen it the next night or it would cycle by another time. Maybe it did and we weren't looking out the window.

LOUSMA You might point out that it never did take the shape of an object but it was always brighter than any other star or planet in the night sky. It was much brighter.

BEAN We tried monitors and everything on it but we could never make it into anything other than a bright light.

LOUSMA In doing T002, I had on other occasions, at least once or twice, seen other satellites although they appeared as star points of light.

BEAN Let's talk about caution/warnings at night and in the daytime. I noticed at first when we did have caution/warnings in the daytime we all whistled up there real quick to see what was happening. Then as the mission wore on, we tended to just let whoever was closest take a look. Without the TACS on, there isn't a lot that can go on except rapid DELTA-P which sounds different than any of the other caution/warnings, particularly just a caution. I recommend to Jerry and his crew, and I'm sure that this recommendation will be hard to live by, that caution/warnings don't appear to be anything you have to hurry and resolve or stop doing your tasks to race up to the panel

20.0 VISUAL SIGHTINGS

LOUSMA Let's talk about visual sightings. Any comments on countdown. You saw your way to the booster or you didn't see that. Visual sighting no problem there.

BEAN You might want to talk about the visual sightings on that orbit when Owen and Jack saw the satellite.

LOUSMA Yes, let's go through countdown. Any visual sightings on countdown that were significant? We saw the swing arm go away and all that kind of thing.

Powered Flight: I watched the booster protector cover go off and lots of flashes and debris and everything in every separation, but that's all norminal. During orbit: -

GARRIOTT Do you want to talk about that satellite?

LOUSMA I saw a couple of satellites that appeared like a satellite would on the Earth. I saw one that was not like one you would see on Earth, so why don't you mention it.

GARRIOTT Okay, about a week or 10 days before recovery and we were still waiting for information to be supplied to us about the indentification. Jack first noticed this rather large red star out the wardroom window. Upon close examination, it was much brighter than Jupiter or any of the other planets. It had

GARRIOTT (CONT'D) a reddish hue to it, even though it was well above the horizon. The light from the Sun was not passing close to the Earth's limb at the time. We observed it for about 10 minutes prior to sunset. It was slowly rotating because it had a variation in brightness with a 10-second period. As I was saying, we observed it for about 10 minutes, until we went into darkness, and it also followed us into darkness about 5-seconds later. From the 5- to 10-second delay in it's disappearance we surmised that it was not more than 30 to 50 nautical miles from our location. From it's original position in the wardroom window, it did not move more than 10 or 20 degrees over the 10 minutes or so that we watched it. It's orbit was very close to that of our own. We never saw it on any - earlier or succeeding orbits and we'd be quite interested in having its identification established. It's all debriefed in terms of time on channel A, so the percise timing and location can be picked up from there.

LOUSMA Okay, other visual sightings was the one out the wardroom window. That sunrise or sunset which finally led us to the RCS leak in the command module. It disappeared like thousands and thousands of stars out there; all of them different sizes and drifting along the X-axis. The one that we already mentioned. The one right after insertion where we saw the leak in the same manner of the RCS streaming towards

BE4/K. Grimwood

JSC-08809

SKYLAB 1/4 TECHNICAL CREW DEBRIEFING

FEBRUARY 22, 1974

PART I

PREPARED BY

TRAINING OFFICE

CREW TRAINING AND PROCEDURES DIVISION

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Houston, Texas

GIBSON (CONT'D) are still on the windows. Just what that material is, I'm not sure. But the remaining pieces should be useful for contamination studies.

CARR One other item is the ammonia odor in the head which we discovered about the last week in the mission. We weren't sure what was causing it. Bill had changed out the charcoal canister. We disconnected the boot between the charcoal canister and the blower above it and took a sniff of that. We smelled, no ammonia there. When we connected the boot back up to the blower, a very strong ammonia odor came from the blower output. Thus it appears that the source of the smell was the blower unit itself and not the charcoal canister. As we said in our report of it to the ground, we decided that it was tolerable for the rest of the mission. Therefore, we didn't get into the mode of finding another blower to put in there. I feel that the odor very definitely increased in intensity during the final week of the mission.

CARR One other area of unusual events that we reported on the dump tapes was that on occasion we saw some lights flashing outside with very a definite motion relative to ours. We presumed that they were other pieces of Skylab, or possibly other satellites. We reported our two or three sightings of that kind as soon as they occurred. We have no special comments concerning them,

CARR (CONT'D) but we did find it very interesting to be able to see other objects up there with us. The fact that one or two of them appeared to be tumbling was apparently due to the oscillation of the light flashes that we were getting from them.

POGUE The OWS Heat Exchangers: There's a major design flaw there in that filters were not installed upstream of the OWS heat exchanger vanes. When we first arrived, the vanes were so uniformly coated with lint that I thought there was some kind of anodized surface on them. I was never fully convinced that I had done the vacumming job properly; therefore, I fabricated a special tool that fit flush against those surface vanes so that I could exert a good vacuum. Though they are not supposed to be condensive heat exchangers, I sucked quite a bit of condensate water out of them. I tried the best I could to keep those things clean, yet I never did get all that lint pulled out of there. That is why I think we needed a filter in the system.

GIBSON EVA anomalies might also be mentioned here. For example, you had the water leak outside, and I also got a water leak.

POGUE One thing that was not mentioned on air-to-ground as a possible cause of the problem was the single-point failure that exists in the mechanical way that the PCU composite connector is hooked to the PCU. I was able during EVA, maneuvering through the clothesline ropes, not only to open the lock but also to extend the arm which pulls the PCU composite connector off.